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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XE490

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the San Francisco Ferry Terminal Expansion Project, South Basin Improvements Project

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that we have issued an incidental harassment authorization (IHA) to The San Francisco Bay Area Water Emergency Transportation Authority (WETA) to incidentally harass marine mammals during construction activities associated with the San Francisco Ferry Terminal, South Basin Improvements project in San Francisco, CA.

DATES: This authorization is effective from June 28, 2016 through December 31, 2016.

FOR FURTHER INFORMATION CONTACT: Laura McCue, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Availability

An electronic copy of WETA's application and supporting documents, as well as a list of the references cited in this document, and the final Environmental Assessment (EA) and our

associated Finding of No Significant Impact, prepared pursuant to the National Environmental Policy Act may be obtained by visiting the Internet at:

www.nmfs.noaa.gov/pr/permits/incidental/construction.html. In case of problems accessing these documents, please call the contact listed above (see **FOR FURTHER INFORMATION CONTACT**).

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified area, the incidental, but not intentional, taking of small numbers of marine mammals, providing that certain findings are made and the necessary prescriptions are established.

The incidental taking of small numbers of marine mammals may be allowed only if NMFS (through authority delegated by the Secretary) finds that the total taking by the specified activity during the specified time period will (i) have a negligible impact on the species or stock(s) and (ii) not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant). Further, the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such taking must be set forth, either in specific regulations or in an authorization.

The allowance of such incidental taking under section 101(a)(5)(A), by harassment, serious injury, death, or a combination thereof, requires that regulations be established. Subsequently, a Letter of Authorization may be issued pursuant to the prescriptions established in such regulations, providing that the level of taking will be consistent with the findings made for the total taking allowable under the specific regulations. Under section 101(a)(5)(D), NMFS

may authorize such incidental taking by harassment only, for periods of not more than one year, pursuant to requirements and conditions contained within an IHA. The establishment of prescriptions through either specific regulations or an authorization requires notice and opportunity for public comment.

NMFS has defined “negligible impact” in 50 CFR 216.103 as “...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.” Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines “harassment” as: “...any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].”

Summary of Request

On February 8, 2016, we received a request from WETA for authorization of the taking, by level B harassment only, of marine mammals, incidental to pile driving and removal in association with the San Francisco Ferry Terminal Expansion Project, South Basin Improvements Project in San Francisco Bay, California. That request was modified to include additional species and additional monitoring and mitigation measures on March 28, 2016 and May 2, 2016, and a final version, which we deemed adequate and complete, was submitted on May 13, 2016, which included revised take numbers and additional mitigation measures. In-water work associated with the project is expected to be completed within 23 months. This proposed IHA is for the first phase of construction activities, to occur in 2016

The use of both vibratory and impact pile driving and removal is expected to produce underwater sound at levels that have the potential to result in behavioral harassment of marine mammals. Seven species of marine mammals have the potential to be affected by the specified activities: harbor seal (*Phoca vitulina*), California sea lion (*Zalophus californianus*), Northern elephant seal (*Mirounga angustirostris*), Northern fur seal (*Callorhinus ursinus*), harbor porpoise (*Phocoena phocoena*), gray whale (*Eschrichtius robustus*), and bottlenose dolphin (*Tursiops truncatus*). These species may occur year round in the action area.

Similar construction and pile driving activities in San Francisco Bay have been authorized by NMFS in the past. These projects include construction activities at the Exploratorium (75 FR 66065), pier 36 (77 FR 20361), and the Oakland Bay Bridge (71 FR 26750; 72 FR 25748; 74 FR 41684; 76 FR 7156; 78 FR 2371; 79 FR 2421; and 80 FR 43710).

Description of the Specified Activity

Overview

The San Francisco Bay Area Water Emergency Transportation Authority (WETA) is expanding berthing capacity at the Downtown San Francisco Ferry Terminal (Ferry Terminal), located at the San Francisco Ferry Building (Ferry Building), to support existing and future planned water transit services operated on San Francisco Bay by WETA and WETA's emergency operations.

The Downtown San Francisco Ferry Terminal Expansion Project would eventually include phased construction of three new water transit gates and overwater berthing facilities, in addition to supportive landside improvements, such as additional passenger waiting and queuing areas, circulation improvements, and other water transit-related amenities. The new gates and other improvements would be designed to accommodate future planned water transit services

between Downtown San Francisco and Antioch, Berkeley, Martinez, Hercules, Redwood City, Richmond, and Treasure Island, as well as emergency operation needs. According to current planning and operating assumptions, WETA will not require all three new gates (Gates A, F, and G) to support existing and new services immediately. As a result, WETA is planning that project construction will be phased. The first phase will include construction of Gates F and G, as well as other related improvements in the South Basin.

Dates and Duration

The total project is expected to require a maximum of 130 days of in-water pile driving. The project may require up to 23 months for completion; with a maximum of 106 days for pile driving in the first year. In-water activities are limited to occur between June 28, 2016 and November 30, 2016 and June 1 through November 30, 2017. If in-water work will extend beyond the effective dates of the IHA, a second IHA application will be submitted by WETA. This proposed authorization would be effective from June 28, 2016 to December 31, 2016.

Specific Geographic Region

The San Francisco ferry terminal is located in the western shore of San Francisco Bay (see Figure 1 of WETA's application). The ferry terminal is five blocks north of the San Francisco Oakland Bay Bridge. More specifically, the south basin of the ferry terminal is located between Pier 14 and the ferry plaza. San Francisco Bay and the adjacent Sacramento-San Joaquin Delta make up one of the largest estuarine systems on the continent. The Bay has undergone extensive industrialization, but remains an important environment for healthy marine mammal populations year round. The area surrounding the proposed activity is an intertidal landscape with heavy industrial use and boat traffic.

Detailed Description of Activities

The project supports existing and future planned water transit services operated by WETA, and regional policies to encourage transit uses. Furthermore, the project addresses deficiencies in the transportation network that impede water transit operation, passenger access, and passenger circulation at the Ferry Terminal.

The project includes construction of two new water transit gates and associated overwater berthing facilities, in addition to supportive improvements, such as additional passenger waiting and queuing areas and circulation improvements in a 7.7-acre area (see Figure 1 in the WETA's application, which depicts the project area, and Figure 2, which depicts the project improvements). The project includes the following elements: (1) Removal of portions of existing deck and pile construction (portions will remain as open water, and other portions will be replaced); (2) Construction of two new gates (Gates F and G); (3) Relocation of an existing gate (Gate E); and (4) Improved passenger boarding areas, amenities, and circulation, including extending the East Bayside Promenade along Gates E, F, and G; strengthening the South Apron of the Agriculture Building; creating the Embarcadero Plaza; and installing weather protection canopies for passenger queuing.

Implementation of the project improvements will result in a change in the type and area of structures over San Francisco Bay. In some areas, structures will be demolished and then rebuilt. The project will require both the removal and installation of piles as summarized in Table 1. Demolition and construction could be completed within 23 months.

Table 1. Summary of Pile Removal and Installation in 2016

Project Element	Pile Diameter	Pile Type	Method	Number of Piles/ Schedule
Demolition in the South Basin	12 to 18 inches	Wood and concrete	Pull or cut off 2 feet below mud line.	350 piles/30 days 2016

Removal of Dolphin Piles in the South Basin	36 inches	Steel: 140 to 150 feet in length	Pull out.	Four dolphin piles/ 1 day
Embarcadero Plaza and East Bayside Promenade	24 or 36 inches	Steel: 135 to 155 feet in length	Impact or Vibratory Driver	220 24- or 36-inch piles/65 days 2016
Fender Piles	14 inches	Polyurethane-coated pressure-treated wood; 64 feet in length	Impact or Vibratory Driver	38/10 days 2016

Removal of Existing Facilities

As part of the project, the remnants of Pier 2 will be demolished and removed. This consists of approximately 21,000 square feet of existing deck structure supported by approximately 350 wood and concrete piles. In addition, four dolphin piles will be removed. Demolition will be conducted from barges. Two barges will be required: one for materials storage, and one outfitted with demolition equipment (crane, clamshell bucket for pulling of piles, and excavator for removal of the deck). Diesel-powered tug boats will bring the barges to the project area, where they will be anchored. Piles will be removed by either cutting them off two feet below the mud line, or pulling the pile through vibratory extraction.

Construction of Gates and Berthing Structures

The new gates (Gates F and G) will be built similarly. Each gate will be designed with an entrance portal—a prominent doorway physically separating the berthing structures from the surrounding area. Berthing structures will be provided for each new gate, consisting of floats, gangways, and guide piles. The steel floats will be approximately 42 feet wide by 135 feet long. The steel truss gangways will be approximately 14 feet wide and 105 feet long. The gangway will be designed to rise and fall with tidal variations while meeting Americans with Disabilities Act (ADA) requirements. The gangway and the float will be designed with canopies, consistent with the current design of existing Gates B and E. The berthing structures will be fabricated off

site and floated to the project area by barge. Six steel guide piles will be required to secure each float in place. In addition, dolphin piles may be used at each berthing structure to protect against the collision of vessels with other structures or vessels. A total of up to 14 dolphin piles may be installed.

Chock-block fendering will be added along the East Bayside Promenade, to adjacent structures to protect against collision. The chock-block fendering will consist of square, 12-inch-wide, polyurethane-coated, pressure-treated wood blocks that are connected along the side of the adjacent pier structure, and supported by polyurethane-coated, pressure-treated wood piles. In addition, the existing Gate E float will be moved 43 feet to the east, to align with the new gates and East Bayside Promenade. The existing six 36-inch-diameter steel guide piles will be removed using vibratory extraction, and reinstalled to secure the Gate E float in place. Because of Gate E's new location, to meet ADA requirements, the existing 90-foot-long steel truss gangway will be replaced with a longer, 105-foot-long gangway.

Passenger Boarding and Circulation Areas

Several improvements will be made to passenger boarding and circulation areas. New deck and pile-supported structures will be built.

- An Embarcadero Plaza, elevated approximately 3 to 4 feet above current grade, will be created. The Embarcadero Plaza will require new deck and pile construction to fill an open-water area and replace existing structures that do not comply with Essential Facilities requirements.
- The East Bayside Promenade will be extended to create continuous pedestrian access to Gates E, F, and G, as well as to meet public access and pedestrian circulation requirements along San Francisco Bay. It will extend approximately 430 feet in length, and will provide an approximately 25-foot-wide area for pedestrian circulation and public access along Gates E, F, and G. The perimeter of the East Bayside Promenade will also include a curbed edge with a guardrail.

- Short access piers, approximately 30 feet wide and 45 feet long, will extend from the East Bayside Promenade to the portal for each gate.
- The South Apron of the Agriculture Building will be upgraded to temporarily support access for passenger circulation. Depending on their condition, as determined during Final Design, the piles supporting this apron may need to be strengthened with steel jackets.
- Two canopies will be constructed along the East Bayside Promenade: one between Gates E and F, and one between Gates F and G. Each of the canopies will be 125 feet long and 20 feet wide. Each canopy will be supported by four columns at 35 feet on center, with 10-foot cantilevers at either end. The canopies will be constructed of steel and glass, and will include photovoltaic cells.

The new deck will be constructed on the piles, using a system of beam-and-flat-slab-concrete construction, similar to what has been built in the Ferry Building area. The beam-and-slab construction will be either precast or cast-in-place concrete (or a combination of the two), and approximately 2.5 feet thick. Above the structure, granite paving or a concrete topping slab will provide a finished pedestrian surface.

The passenger facilities, amenities, and public space improvements—such as the entrance portals, canopy structures, lighting, guardrails, and furnishings—will be surface-mounted on the pier structures after the new construction and repair are complete. The canopies and entrance portals will be constructed offsite, delivered to the site, craned into place by barge, and assembled onsite. The glazing materials, cladding materials, granite pavers, guardrails, and furnishings will be assembled onsite.

Dredging Requirements

The side-loading vessels require a depth of 12.5 feet below mean lower low water (MLLW) on the approach and in the berthing area. Based on a bathymetric survey conducted in 2015, it is estimated that the new Gates F and G will require dredging to meet the required

depths. The expected dredging volumes are presented in Table 2. These estimates are based on dredging the approach areas to 123.5 feet below MLLW, and 2 feet of overdredge depth, to account for inaccuracies in dredging practices. The dredging will take approximately 2 months.

Table 2. Summary of Dredging Requirements

Dredging Element	Summary
Initial Dredging	
Gate F	0.78 acre/6,006 cubic yards
Gate G	1.64 acres/14,473 cubic yards
Total for Gates F and G	2.42 acres/20,479 cubic yards
Staging	On barges
Typical Equipment	Clamshell dredge on barge; disposal barge; survey boat
Duration	2 months
Maintenance Dredging	
Gates F and G	5,000 to 10,000 cubic yards
Frequency	Every 3 or 4 years

Based on observed patterns of sediment accumulation in the Ferry Terminal area, significant sediment accumulation will not be expected, because regular maintenance dredging is not currently required to maintain operations at existing Gates B and E. However, some dredging will likely be required on a regular maintenance cycle beneath the floats at Gates F and G, due to their proximity to the Pier 14 breakwater. It is expected that maintenance dredging will be required every 3 to 4 years, and will require removal of approximately 5,000 to 10,000 cubic yards of material.

Dredging and disposal of dredged materials will be conducted in cooperation with the San Francisco Dredged Materials Management Office (DMMO), including development of a sampling plan, sediment characterization, a sediment removal plan, and disposal in accordance with the Long-Term Management Strategy for San Francisco Bay to ensure beneficial reuse, as appropriate. DMMO consultation is expected to begin in early 2016. Based on the results of the sediment analysis, the alternatives for placement of dredged materials will be evaluated,

including disposal at the San Francisco Deep Ocean Disposal Site, disposal at an upland facility, or beneficial reuse. Selection of the disposal site will be reviewed and approved by the DMMO.

Comments and Responses

We published a notice of receipt of WETA's application and proposed IHA in the **Federal Register** on May 25, 2016 (81 FR 33217). We received one comment, a letter from the Marine Mammal Commission concurring with NMFS's preliminary findings.

Comment: The Commission recommends the issuance of the IHA, subject to the inclusion of the proposed mitigation, monitoring, and reporting measures.

Response: We appreciate the Commission's concurrence with our findings and appreciate their input and support. We made minor changes to the monitoring requirements, including allowing only one observer if impact driving is the only method of installation used on one day; and allowing WETA to modify the zones from data from hydroacoustic monitoring, with NMFS concurrence, and if the zones are small enough, to only have one observer. NMFS believes these changes will still allow the mitigation and monitoring measures to effect the least practicable impact on marine mammal species or stocks and their habitat.

Description of Marine Mammals in the Area of the Specified Activity

There are seven marine mammal species which may inhabit or may likely transit through the waters nearby the Ferry Terminal, and which are expected to potentially be taken by the specified activity. These include the Pacific harbor seal (*Phoca vitulina*), California sea lion (*Zalophus californianus*), Northern Elephant seal (*Mirounga angustirostris*), Northern fur seal (*Callorhinus ursinus*), harbor porpoise (*Phocoena phocoena*), gray whale (*Eschrichtius robustus*), and bottlenose dolphin (*Tursiops truncatus*). Multiple additional marine mammal species may occasionally enter the activity area in San Francisco Bay but would not be expected

to occur in shallow nearshore waters of the action area. Guadalupe fur seals (*Arctocephalus townsendi*) generally do not occur in San Francisco Bay; however, there have been recent sightings of this species due to the El Niño event. Only single individuals of this species have occasionally been sighted inside San Francisco Bay, and their presence near the action area is considered unlikely. No takes are requested for this species, and mitigation measures such as a shutdown zone will be in effect for this species if observed approaching the Level B harassment zone. Although it is possible that a humpback whale (*Megaptera navaeangliae*) may enter San Francisco Bay and find its way into the project area during construction activities, their occurrence is unlikely. No takes are requested for this species, and mitigation measures such as a delay and shutdown procedure will be in effect for this species if observed approaching the Level B harassment zone. Table 3 lists the marine mammal species with expected potential for occurrence in the vicinity of the SF Ferry terminal during the project timeframe and summarizes key information regarding stock status and abundance. Taxonomically, we follow Committee on Taxonomy (2014). Please see NMFS' Stock Assessment Reports (SAR), available at www.nmfs.noaa.gov/pr/sars, for more detailed accounts of these stocks' status and abundance. Please also refer to NMFS' website (www.nmfs.noaa.gov/pr/species/mammals) for generalized species accounts. We provided additional information for marine mammals with potential for occurrence in the area of the specified activity in our **Federal Register** notice of proposed authorization (May 25, 2016; 81 FR 33217).

Table 3. Marine Mammals Potentially Present in the Vicinity of San Francisco Ferry Terminal

Species	Stock	ESA/MMPA status; Strategic (Y/N) ¹	Stock abundance (CV, N _{min} , most recent abundance survey) ²	PBR ³	Relative occurrence in Strait of Juan de Fuca; season of occurrence
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales, dolphins, and porpoises)					
Family Phocoenidae (porpoises)					

Harbor porpoise	San Francisco-Russian River	-; N	9,886 (0.51; 6,625; 2011)	66	Common
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales, dolphins, and porpoises)					
Family Delphinidae (dolphins)					
Bottlenose dolphin ⁴	California coastal	-; N	323 (0.13; 290; 2005)	2.4	Rare
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales, dolphins, and porpoises)					
Family Eschrichtiidae					
Gray whale	Eastern N. Pacific	-; N	20,990 (0.05; 20,125; 2011)	624	Rare
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)					
Family Balaenopteridae					
Humpback whale	California/Oregon/Washington stock	E; S	1,918	11	Unlikely
Order Carnivora – Superfamily Pinnipedia					
Family Otariidae (eared seals and sea lions)					
California sea lion	U.S.	-; N	296,750 (n/a; 153,337; 2011)	9,200	Common
Guadalupe fur seal ⁵	Mexico to California	T; S	7,408 (n/a; 3,028; 1993)	91	Unlikely
Northern fur seal	California stock	-;N	14,050 (n/a; 7,524; 2013)	451	Unlikely
Family Phocidae (earless seals)					
Harbor seal	California	-; N	30,968 (n/a; 27,348; 2012)	1,641	Common; Year-round resident
Northern elephant seal	California breeding stock	-; N	179,000 (n/a; 81,368; 2010)	4,882	Rare

¹ESA status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR (see footnote 3) or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

²CV is coefficient of variation; N_{\min} is the minimum estimate of stock abundance. In some cases, CV is not applicable. For certain stocks, abundance estimates are actual counts of animals and there is no associated CV. The most recent abundance survey that is reflected in the abundance estimate is presented; there may be more recent surveys that have not yet been incorporated into the estimate.

³Potential biological removal, defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population size (OSP).

⁴Abundance estimates for these stocks are greater than eight years old and are therefore not considered current. PBR is considered undetermined for these stocks, as there is no current minimum abundance estimate for use in calculation. We nevertheless present the most recent abundance estimates and PBR values, as these represent the best available information for use in this document.

Potential Effects of the Specified Activity on Marine Mammals and their Habitat

Our **Federal Register** notice of proposed authorization (May 25, 2016; 81 FR 33217) provides a general background on sound relevant to the specified activity as well as a detailed description of marine mammal hearing and of the potential effects of these construction activities on marine mammals and their habitat.

Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses.

Measurements from similar pile driving events were coupled with practical spreading loss to estimate zones of influence (ZOI; see Estimated Take by Incidental Harassment); these values were used to develop mitigation measures for pile driving and removal activities at the ferry terminal. The ZOIs effectively represent the mitigation zone that will be established around each pile to prevent Level A harassment to marine mammals, while providing estimates of the areas within which Level B harassment might occur. In addition to the specific measures described later in this section, WETA will conduct briefings between construction supervisors and crews, marine mammal monitoring team, and WETA staff prior to the start of all pile driving activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

Monitoring and Shutdown for Construction Activities

The following measures will apply to WETA's mitigation through shutdown and disturbance zones:

Shutdown Zone – For all pile driving activities, WETA will establish a shutdown zone intended to contain the area in which SPLs equal or exceed the 180/190 dB rms acoustic injury criteria for cetaceans and pinnipeds, respectively. The purpose of a shutdown zone is to define an area within which shutdown of activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area), thus preventing injury of marine mammals (as described previously, serious injury or death are unlikely outcomes even in the absence of mitigation measures). Modeled radial distances for shutdown zones are shown in Table 4. However, a minimum shutdown zone of 10 m will be established during all pile driving activities, regardless of the estimated zone. Vibratory pile driving and removal activities are not predicted to produce sound exceeding the 180/190-dB Level A harassment threshold, but these precautionary measures are intended to prevent the already unlikely possibility of physical interaction with construction equipment and to further reduce any possibility of acoustic injury.

Disturbance Zone – Disturbance zones are the areas in which SPLs equal or exceed 160 and 120 dB rms (for impulse and continuous sound, respectively). Disturbance zones provide utility for monitoring conducted for mitigation purposes (*i.e.*, shutdown zone monitoring) by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring of disturbance zones enables observers to be aware of and communicate the presence of marine mammals in the project area but outside the shutdown zone and thus prepare for potential shutdowns of activity. However, the primary purpose of disturbance zone monitoring is for documenting instances of Level B harassment; disturbance zone monitoring is discussed in greater detail later (see Proposed Monitoring and Reporting). Nominal radial distances for

disturbance zones are shown in Table 4. Given the size of the disturbance zone for vibratory pile driving, it is impossible to guarantee that all animals would be observed or to make comprehensive observations of fine-scale behavioral reactions to sound, and only a portion of the zone (*e.g.*, what may be reasonably observed by visual observers stationed within the turning basin) would be observed.

In order to document observed instances of harassment, monitors record all marine mammal observations, regardless of location. The observer's location, as well as the location of the pile being driven, is known from a GPS. The location of the animal is estimated as a distance from the observer, which is then compared to the location from the pile. It may then be estimated whether the animal was exposed to sound levels constituting incidental harassment on the basis of predicted distances to relevant thresholds in post-processing of observational and acoustic data, and a precise accounting of observed incidences of harassment created. This information may then be used to extrapolate observed takes to reach an approximate understanding of actual total takes.

Monitoring Protocols – Monitoring will be conducted before, during, and after pile driving and vibratory removal activities. In addition, observers shall record all instances of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven. Observations made outside the shutdown zone will not result in shutdown; that pile segment would be completed without cessation, unless the animal approaches or enters the shutdown zone, at which point all pile driving activities would be halted. Monitoring will take place from fifteen minutes prior to initiation through thirty minutes post-completion of pile driving and removal activities. Pile driving activities include the time to install or remove a single pile or series of piles, as long as

the time elapsed between uses of the pile driving equipment is no more than thirty minutes.

Please see the Monitoring Plan (www.nmfs.noaa.gov/pr/permits/incidental/construction.htm),

developed by WETA in agreement with NMFS, for full details of the monitoring protocols.

The following additional measures apply to visual monitoring:

(1) Monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator. A minimum of two observers will be required for all pile driving/removal activities, unless only impact driving is to occur on that day, in which case only one observer will be required. This was modified from the proposed FR notice. It was determined that one MMO could adequately survey the impact driving zones. Qualified observers are typically trained biologists, with the following minimum qualifications:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water

construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; and

- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

(2) Prior to the start of pile driving activity, the shutdown zone will be monitored for fifteen minutes to ensure that it is clear of marine mammals. Pile driving will only commence once observers have declared the shutdown zone clear of marine mammals; animals will be allowed to remain in the shutdown zone (*i.e.*, must leave of their own volition) and their behavior will be monitored and documented. The shutdown zone may only be declared clear, and pile driving started, when the entire shutdown zone is visible (*i.e.*, when not obscured by dark, rain, fog, *etc.*). In addition, if such conditions should arise during impact pile driving that is already underway, the activity will be halted.

(3) If a marine mammal approaches or enters the shutdown zone during the course of pile driving operations, activity will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or fifteen minutes have passed without re-detection of small cetaceans and pinnipeds, and thirty minutes for gray whales. Monitoring will be conducted throughout the time required to drive a pile.

(4) Using delay and shut-down procedures, if a species for which authorization has not been granted (including but not limited to Guadalupe fur seals and humpback whales) or if a species for which authorization has been granted but the authorized takes are met, approaches or is observed within the Level B harassment zone, activities will shut down immediately and not restart until the animals have been confirmed to have left the area.

Soft Start

The use of a soft start procedure is believed to provide additional protection to marine mammals by warning or providing a chance to leave the area prior to the hammer operating at full capacity, and typically involves a requirement to initiate sound from the hammer at reduced energy followed by a waiting period. This procedure is repeated two additional times. It is difficult to specify the reduction in energy for any given hammer because of variation across drivers and, for impact hammers, the actual number of strikes at reduced energy will vary because operating the hammer at less than full power results in “bouncing” of the hammer as it strikes the pile, resulting in multiple “strikes.” For impact driving, we require an initial set of three strikes from the impact hammer at reduced energy, followed by a thirty-second waiting period, then two subsequent three strike sets. Soft start will be required at the beginning of each day’s impact pile driving work and at any time following a cessation of impact pile driving of thirty minutes or longer.

We have carefully evaluated WETA’s proposed mitigation measures and considered their effectiveness in past implementation to determine whether they are likely to effect the least practicable impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another: (1) the manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals, (2) the proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and (3) the practicability of the measure for applicant implementation.

Any mitigation measure(s) we prescribe should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed below:

- (1) Avoidance or minimization of injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal).
- (2) A reduction in the number (total number or number at biologically important time or location) of individual marine mammals exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).
- (3) A reduction in the number (total number or number at biologically important time or location) of times any individual marine mammal would be exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).
- (4) A reduction in the intensity of exposure to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing the severity of behavioral harassment only).
- (5) Avoidance or minimization of adverse effects to marine mammal habitat, paying particular attention to the prey base, blockage or limitation of passage to or from biologically important areas, permanent destruction of habitat, or temporary disturbance of habitat during a biologically important time.
- (6) For monitoring directly related to mitigation, an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of WETA's proposed measures, as well as any other potential measures that may be relevant to the specified activity, we have determined that the proposed

mitigation measures provide the means of effecting the least practicable impact on marine mammal species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth “requirements pertaining to the monitoring and reporting of such taking.” The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for incidental take authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area.

Any monitoring requirement we prescribe should improve our understanding of one or more of the following:

- Occurrence of marine mammal species in action area (*e.g.*, presence, abundance, distribution, density).
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of:
(1) Action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) Affected species (*e.g.*, life history, dive patterns); (3) Co-occurrence of marine mammal species with the action; or (4) Biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas).
- Individual responses to acute stressors, or impacts of chronic exposures (behavioral or physiological).

- How anticipated responses to stressors impact either: (1) Long-term fitness and survival of an individual; or (2) Population, species, or stock.
- Effects on marine mammal habitat and resultant impacts to marine mammals.
- Mitigation and monitoring effectiveness.

WETA's planned monitoring and reporting is also described in their Marine Mammal Monitoring Plan, on the Internet at www.nmfs.noaa.gov/pr/permits/incidental/construction.htm.

Hydroacousting Monitoring

Hydroacoustic monitoring will be conducted during a minimum of ten percent of all pile driving activities. The monitoring will be done in accordance with the methodology outlined in this Hydroacoustic Monitoring Plan (see Appendix A of WETA's application for more information on this plan, including the methodology, equipment, and reporting information). The monitoring will be conducted based on the following:

- Be based on the dual metric criteria (Popper *et al.*, 2006) and the accumulated sound exposure level (SEL);
- Establish field locations that will be used to document the extent of the area experiencing 187 decibels (dB) SEL accumulated;
- Establish the distance to the Marine Mammal Level A and Level B Safety and Harassment zones;
- Describe the methods necessary to continuously assess underwater noise on a real-time basis, including details on the number, location, distance and depth of hydrophones, and associated monitoring equipment;
- Provide a means of recording the time and number of pile strikes, the peak sound energy per strike, and interval between strikes;
- Provide provisions to provide all monitoring data to the CDFW and NMFS.

Visual Marine Mammal Observations

WETA will collect sighting data and behavioral responses to construction for marine mammal species observed in the region of activity during the period of activity. All observers (MMOs) will be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. A minimum of two MMOs will be required for all pile driving/removal activities, unless only impact driving is to occur on that day, in which case only one observer will be required. WETA will monitor the shutdown zone and disturbance zone before, during, and after pile driving, with observers located at the best practicable vantage points. Based on our requirements, WETA will implement the following procedures for pile driving and removal:

- MMOs will be located at the best vantage point(s) in order to properly see the entire shutdown zone and as much of the disturbance zone as possible.
- During all observation periods, observers will use binoculars and the naked eye to search continuously for marine mammals.
- If the shutdown zones are obscured by fog or poor lighting conditions, pile driving at that location will not be initiated until that zone is visible. Should such conditions arise while impact driving is underway, the activity will be halted.
- The shutdown and disturbance zones around the pile will be monitored for the presence of marine mammals before, during, and after any pile driving or removal activity.

Individuals implementing the monitoring protocol will assess its effectiveness using an adaptive approach. The monitoring biologists will use their best professional judgment throughout implementation and seek improvements to these methods when deemed appropriate. Any modifications to protocol will be coordinated between NMFS and WETA.

In addition, the MMO(s) will survey the potential Level A and nearby Level B harassment zones (areas within approximately 2,000 feet of the pile-driving area observable from the shore) on 2 separate days—no earlier than 7 days before the first day of construction—to establish baseline observations. Monitoring will be timed to occur during various tides (preferably low and high tides) during daylight hours from locations that are publicly accessible (e.g., Pier 14 or the Ferry Plaza). The information collected from baseline monitoring will be used for comparison with results of monitoring during pile-driving activities.

Data Collection

We require that observers use approved data forms. Among other pieces of information, WETA will record detailed information about any implementation of shutdowns, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any. In addition, WETA will attempt to distinguish between the number of individual animals taken and the number of incidences of take. We require that, at a minimum, the following information be collected on the sighting forms:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (*e.g.*, percent cover, visibility);
- Water conditions (*e.g.*, sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including bearing and direction of travel, and if possible, the correlation to SPLs;
- Distance from pile driving or removal activities to marine mammals and distance from the marine mammals to the observation point;

- Description of implementation of mitigation measures (*e.g.*, shutdown or delay);
- Locations of all marine mammal observations; and
- Other human activity in the area.

Reporting

A draft report will be submitted to NMFS within 90 days of the completion of marine mammal monitoring, or 60 days prior to the requested date of issuance of any future IHA for projects at the same location, whichever comes first. The report will include marine mammal observations pre-activity, during-activity, and post-activity during pile driving and removal days, and will also provide descriptions of any behavioral responses to construction activities by marine mammals and a complete description of all mitigation shutdowns and the results of those actions and an extrapolated total take estimate based on the number of marine mammals observed during the course of construction. A final report must be submitted within thirty days following resolution of comments on the draft report.

Estimated Take by Incidental Harassment

Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines “harassment” as: “...any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].”

All anticipated takes would be by Level B harassment resulting from vibratory and impact pile driving and removal and involving temporary changes in behavior. The planned mitigation and monitoring measures are expected to minimize the possibility of injurious or

lethal takes such that take by Level A harassment, serious injury, or mortality is considered discountable. However, it is unlikely that injurious or lethal takes would occur even in the absence of the planned mitigation and monitoring measures.

Given the many uncertainties in predicting the quantity and types of impacts of sound on marine mammals, it is common practice to estimate how many animals are likely to be present within a particular distance of a given activity, or exposed to a particular level of sound. In practice, depending on the amount of information available to characterize daily and seasonal movement and distribution of affected marine mammals, it can be difficult to distinguish between the number of individuals harassed and the instances of harassment and, when duration of the activity is considered, it can result in a take estimate that overestimates the number of individuals harassed. In particular, for stationary activities, it is more likely that some smaller number of individuals may accrue a number of incidences of harassment per individual than for each incidence to accrue to a new individual, especially if those individuals display some degree of residency or site fidelity and the impetus to use the site (*e.g.*, because of foraging opportunities) is stronger than the deterrence presented by the harassing activity.

The area where the ferry terminal is located is not considered important habitat for marine mammals, as it is a highly industrial area with high levels of vessel traffic and background noise. While there are harbor seal haul outs within two miles of the construction activity at Yerba Buena Island, and a California sea lion haul out approximately 1.5 miles away at pier 39, behavioral disturbances that could result from anthropogenic sound associated with these activities are expected to affect only a relatively small number of individual marine mammals that may venture near the ferry terminal, although those effects could be recurring over the life of the project if the same individuals remain in the project vicinity. WETA has requested

authorization for the incidental taking of small numbers of harbor seals, Northern elephant seals, Northern fur seals, California sea lions, harbor porpoise, bottlenose dolphin, and gray whales near the San Francisco Ferry Terminal that may result from construction activities associated with the project described previously in this document.

In order to estimate the potential instances of take that may occur incidental to the specified activity, we must first estimate the extent of the sound field that may be produced by the activity and then consider in combination with information about marine mammal density or abundance in the project area. We described applicable sound thresholds for determining effects to marine mammals before describing the information used in estimating the sound fields, the available marine mammal density or abundance information, and the method of estimating potential incidents of take in detail in our **Federal Register** notice of proposed authorization (May 25, 2016; 81 FR 33217). All calculated distances to and the total area encompassed by the marine mammal sound thresholds are provided in Table 4.

All calculated distances to, and the total area encompassed by, the marine mammal sound thresholds are provided in Table 4. No physiological responses are expected from pile-driving operations occurring during project construction. Vibratory pile extraction and driving does not generate high-peak sound-pressure levels commonly associated with physiological damage. Impact driving can produce noise levels in excess of the Level A thresholds, but only within 50 feet (15 meters) of impact-driving of 36-inch piles. The shutdown zone will be equivalent to the area over which Level A harassment may occur, including the 180 dB re 1 μ Pa (cetaceans) and 190 dB re 1 μ Pa (pinnipeds) isopleths (Table 4); however, a minimum 10 m shutdown zone will be applied to these zones as a precautionary measure intended to prevent the already unlikely possibility of physical interaction with construction equipment and to further reduce any

possibility of acoustic injury. The disturbance zones will be equivalent to the area over which Level B harassment may occur, including 160 dB re 1 μ Pa (impact pile driving) and 120 dB re 1 μ Pa (vibratory pile driving) isopleths (Table 4). These zones may be modified based on results from the hydroacoustic monitoring (see Appendix A of WETA's application). This was a change from the proposed FR notice. It was determined that hydroacoustic monitoring will give more accurate information than modeled results, and therefore, should be used as the harassment zones. Any changes will need to be reviewed and approved by NMFS.

Table 4. Distances to Relevant Underwater Sound Thresholds and Areas of Ensonification

Project Element Requiring Pile Installation	Source Levels at 10 meters	Distance to Threshold (m)			Area for Level B Threshold (km ²)
	RMS	190 dB RMS ¹	180 dB RMS ¹	160/ 120 dB RMS ²	
South Basin Pile Demolition and Removal					
18-Inch Wood Piles – Vibratory Driver	150*	0	< 1	1,600*	2.30*
18-Inch Concrete Piles – Vibratory Driver	150	0	< 1	1,000	1.27
36-Inch Steel Piles – Vibratory Driver	169 ³	< 1	2	18,478	86.52
Embarcadero Plaza and East Bayside Promenade and Gates E, F, and G Dolphin and Guide Piles					
36-Inch Steel Piles – Vibratory Driver	169	< 1	2	18,478	86.52
36-Inch Steel Piles – Impact Driver (BCA) ³	183 ³	4	16	341	0.18
24-Inch Steel Piles – Vibratory Driver	163	0	1	7,356	38.07
24-Inch Steel Piles – Impact Driver (BCA)	180 ³	2	10	215	0.09
Fender Piles					
14-Inch Wood Piles- Vibratory Driver	142	0	0	293	0.14
14-Inch Wood Piles – Impact Driver	158	0	0	7	0

¹ For underwater noise, the Level A harassment threshold for cetaceans is 180 dB and 190 dB for pinnipeds.

² For underwater noise, the Level B harassment (disturbance) threshold is 160 dB for impulsive noise and typical ambient levels (120 dB) for continuous noise.

³ The source levels used for vibratory driving of 36 in steel piles, and impact driving with a bubble curtain of 24 in and 36 in steel piles were incorrectly entered into this table in the proposed FR notice. The correct values are shown above.

* This SL is at 16m and was stated as 10m in the proposed FR notice. Because of this revision, the 120 dB distance and the area were updated.

BCA Bubble curtain attenuation will be used during impact driving of steel piles.

dB decibels

RMS root mean square

Marine Mammal Densities

At-sea densities for marine mammal species have been determined for harbor seals and California sea lions in San Francisco Bay; all other estimates here are determined by using observational data taken during marine mammal monitoring associated with the Richmond-San Rafael Bridge retrofit project, the San Francisco-Oakland Bay Bridge (SFOBB), which has been ongoing for the past 15 years, and anecdotal observational reports from local entities. It is not currently possible to identify all observed individuals to stock.

Description of Take Calculation

All estimates are conservative and include the following assumptions:

- All pilings installed at each site would have an underwater noise disturbance equal to the piling that causes the greatest noise disturbance (*i.e.*, the piling farthest from shore) installed with the method that has the largest ZOI. The largest underwater disturbance ZOI would be produced by vibratory driving steel piles. The ZOIs for each threshold are not spherical and are truncated by land masses on either side of the channel which would dissipate sound pressure waves.
- Exposures were based on estimated total of 106 work days. Each activity ranges in amount of days needed to be completed (Table 1). Note that impact driving is likely to occur only on days when vibratory driving occurs.
- In absence of site specific underwater acoustic propagation modeling, the practical spreading loss model was used to determine the ZOI.
- All marine mammal individuals potentially available are assumed to be present within the relevant area, and thus incidentally taken;
- An individual can only be taken once during a 24-h period; and,
- Exposures to sound levels at or above the relevant thresholds equate to take, as defined by the MMPA.

The estimation of marine mammal takes typically uses the following calculation:

For harbor seals and California sea lions: Level B exposure estimate = D (density) * Area of ensonification) * Number of days of noise generating activities.

For all other marine mammal species: Level B exposure estimate = N (number of animals) in the area * Number of days of noise generating activities.

To account for the increase in California sea lion density due to El Niño, the daily take estimated from the observed density has been increased by a factor of 10 for each day that pile driving or removal occurs.

There are a number of reasons why estimates of potential instances of take may be overestimates of the number of individuals taken, assuming that available density or abundance estimates and estimated ZOI areas are accurate. We assume, in the absence of information supporting a more refined conclusion, that the output of the calculation represents the number of individuals that may be taken by the specified activity. In fact, in the context of stationary activities such as pile driving and in areas where resident animals may be present, this number represents the number of instances of take that may accrue to a smaller number of individuals, with some number of animals being exposed more than once per individual. While pile driving and removal can occur any day throughout the in-water work window, and the analysis is conducted on a per day basis, only a fraction of that time (typically a matter of hours on any given day) is actually spent pile driving/ removal. The potential effectiveness of mitigation measures in reducing the number of takes is typically not quantified in the take estimation process. For these reasons, these take estimates may be conservative, especially if each take is considered a separate individual animal, and especially for pinnipeds.

The quantitative exercise described above indicates that no instances of Level A harassment would be expected, independent of the implementation of required mitigation measures. See Table 5 for total estimated instances of take.

Table 5. Calculations for Incidental Take Estimation

Pile Type	Pile-Driver Type	# of driving Days	Estimated Take by Level B Harassment (take per day/total)						
			Harbor Seal	CA Sea Lion ¹	Northern Elephant Seal ²	Harbor Porpoise ²	Gray Whale ²	Northern fur seal ²	Bottlenose dolphin ²
Wood/concrete pile removal	Vibratory	30	2/60	10/300	NA	NA	NA	NA	NA
36-inch dolphin pile removal	Vibratory	1	66/66	110/110	NA	NA	NA	NA	NA
Embarcadero Plaza 36-inch steel piles	Vibratory ³	65	66/4,290	110/7,150	NA	NA	NA	NA	NA
14-inch wood pile	Vibratory ³	10	1/10	10/100	NA	NA	NA	NA	NA
Project Total (2016) ⁴		106	4,426	7,660	21	9	2	10	30

¹1 To account for potential El Niño conditions, take calculated from at-sea densities for California sea lion has been increased by a factor of 10.

²Take is not calculated by activity type for these species with a low potential to occur, only a yearly total is given.

³Piles of this type may also be installed with an impact hammer, which would reduce the estimated take.

⁴This total assumes the more conservative use of 36-inch steel piles used for the Embarcadero Plaza; however, an alternative would be to use 24 in steel piles, which would result in smaller take numbers. Take numbers have been updated from the proposed FR notice based on public comment, and are described in the *Description of Marine Mammals in the Area of the Specified Activity* section

Description of Marine Mammals in the Area of the Specified Activity

Harbor Seals

Monitoring of marine mammals in the vicinity of the SFOBB has been ongoing for 15 years; from those data, Caltrans has produced at-sea density estimates for Pacific harbor seal of 0.77 animals per square kilometer for the fall season (Caltrans, 2015b). Using this density, the potential average daily take for the areas over which the Level B harassment thresholds may be exceeded are estimated in Table 6.

Table 6. Take Calculation for Harbor Seal

Activity	Pile type	Density	Area (km ²)	Take estimate
Vibratory driving and extraction	36-in steel pile ¹	0.77 animal/km ²	86.53	4,290; 66
Vibratory extraction	Wood and concrete piles	0.77 animal/km ²	2.30	60
Vibratory driving	Wood piles	0.77 animal/km ²	0.13	10

¹The more conservative use of 36-inch steel piles for the Embarcadero Plaza was used here; however, an alternative would be to use 24 in steel piles, which would result in smaller take numbers (780 vs 1,690)

A total of 1,756 harbor seal takes are estimated for 2016 (Table 6). This take number is larger than the take number in the proposed IHA. This change was based on public comment and take was increased based on using fall densities instead of summer densities, to be more representative of the season in which construction will occur and may affect harbor seals.

California Sea Lion

Monitoring of marine mammals in the vicinity of the SFOBB has been ongoing for 15 years; from those data, Caltrans has produced at-sea density estimates for California sea lion of 0.31 animals per square mile (0.12 animal per square kilometer) for the late summer to fall season (Caltrans, 2015b). Using this density, the potential average daily take for the areas over which the Level B harassment thresholds may be exceeded is estimated in Table 7.

Table 7. Take Calculation for California Sea Lion

Activity	Pile type	Density	Area (km ²)	Take Estimate
Vibratory driving and extraction	36-in steel pile ¹	0.31 (0.12 animal/km ²)	86.53	7,150*; 110*
Vibratory extraction	Wood and concrete piles	0.31 (0.12 animal/km ²)	2.3	300*
Vibratory driving	Wood piles	0.31 (0.12 animal/km ²)	0.13	100*

* All California sea lion estimates were multiplied by 10 to account for the increased occurrence of this species due to El Niño.

¹The more conservative use of 36-inch steel piles for the Embarcadero Plaza was used here; however, an alternative would be to use 24 in steel piles, which would result in smaller take numbers (3,250 vs 7,150)

All California sea lion estimates were multiplied by 10 to account for the increased occurrence of this species due to El Niño. A total of 7,660 California sea lion takes is estimated for 2016 (Table 5).

Northern Elephant Seal

Monitoring of marine mammals in the vicinity of the SFOBB has been ongoing for 15 years; from those data, Caltrans has produced an estimated at-sea density for northern elephant seal of 0.16 animal per square mile (0.03 animal per square kilometer) (Caltrans, 2015b). Most sightings of northern elephant seal in San Francisco Bay occur in spring or early summer, and are less likely to occur during the periods of in-water work for this project (June/July through November). As a result, densities during pile driving and removal for the proposed action would be much lower. Therefore, we estimate that it is possible that a lone northern elephant seal may enter the Level B harassment area once per week during pile driving or removal, for a total of 21 takes in 2016 (Table 5). This take number is larger than the take number in the proposed IHA. This change was based on public comment and take was increased from 14 to 21 to be more representative of the number of weeks during construction activities over 106 days (21 weeks vs 14 weeks) if one individual was in the Level B harassment area once per week.

Northern Fur Seal

During the breeding season, the majority of the worldwide population is found on the Pribilof Islands in the southern Bering Sea, with the remaining animals spread throughout the North Pacific Ocean. On the coast of California, small breeding colonies are present at San Miguel Island off southern California, and the Farallon Islands off central California (Caretta *et al* 2014). Northern fur seal are a pelagic species and are rarely seen near the shore away from breeding areas. Juveniles of this species occasionally strand in San Francisco Bay, particularly

during El Niño events, for example, during the 2006 El Niño event, 33 fur seals were admitted to the Marine Mammal Center (TMMC, 2016). Some of these stranded animals were collected from shorelines in San Francisco Bay. Due to the recent El Niño event, Northern fur seals are being observed in San Francisco bay more frequently, as well as strandings all along the California coast and inside San Francisco Bay; a trend that is expected to continue this summer through winter (TMMC, personal communication). Because sightings are normally rare; instances recently have been observed, but are not common, and based on estimates from local observations (TMMC, personal communication), it is estimated that ten Northern fur seals will be taken in 2016 (Table 5).

Harbor Porpoise

In the last six decades, harbor porpoises were observed outside of San Francisco Bay. The few harbor porpoises that entered were not sighted past central Bay close to the Golden Gate Bridge. In recent years, however, there have been increasingly common observations of harbor porpoises in central, north, and south San Francisco Bay. Porpoise activity inside San Francisco Bay is thought to be related to foraging and mating behaviors (Keener, 2011; Duffy, 2015). According to observations by the Golden Gate Cetacean Research team as part of their multi-year assessment, over 100 porpoises may be seen at one time entering San Francisco Bay; and over 600 individual animals are documented in a photo-ID database. However, sightings are concentrated in the vicinity of the Golden Gate Bridge and Angel Island, north of the project area, with lesser numbers sighted south of Alcatraz and west of Treasure Island (Keener 2011). Harbor porpoise generally travel individually or in small groups of two or three (Sekiguchi, 1995).

Monitoring of marine mammals in the vicinity of the SFOBB has been ongoing for 15 years; from those data, Caltrans has produced an estimated at-sea density for harbor porpoise of 0.01 animal per square mile (0.004 animal per square kilometer) (Caltrans, 2015b). However, this estimate would be an overestimate of what would actually be seen in the project area. In order to estimate a more realistic take number, we assume it is possible that a small group of individuals (three harbor porpoises) may enter the Level B harassment area on as many as three days of pile driving or removal, for a total of nine harbor porpoise takes per year (Table 5). This take number is larger than the take number in the proposed IHA. This change was based on public comment and take was increased by increasing the number of potential days harbor porpoise may be near the construction activity and incidentally harassed from two to three days to be conservative.

Gray Whale

Historically, gray whales were not common in San Francisco Bay. The Oceanic Society has tracked gray whale sightings since they began returning to San Francisco Bay regularly in the late 1990s. The Oceanic Society data show that all age classes of gray whales are entering San Francisco Bay, and that they enter as singles or in groups of up to five individuals. However, the data do not distinguish between sightings of gray whales and number of individual whales (Winning, 2008). Caltrans Richmond-San Rafael Bridge project monitors recorded 12 living and two dead gray whales in the surveys performed in 2012. All sightings were in either the central or north Bay; and all but two sightings occurred during the months of April and May. One gray whale was sighted in June, and one in October (the specific years were unreported). It is estimated that two to six gray whales enter San Francisco Bay in any given year. Because construction activities are only occurring during a maximum of 106 days in 2016, it is estimated

that two gray whales may potentially enter the area during the construction period, for a total of 2 gray whale takes in 2016 (Table 5).

Bottlenose Dolphin

Since the 1982-83 El Niño, which increased water temperatures off California, bottlenose dolphins have been consistently sighted along the central California coast (Caretta *et al.* 2008). The northern limit of their regular range is currently the Pacific coast off San Francisco and Marin County, and they occasionally enter San Francisco Bay, sometimes foraging for fish in Fort Point Cove, just east of the Golden Gate Bridge. In the summer of 2015, a lone bottlenose dolphin was seen swimming in the Oyster Point area of South San Francisco (GGCR, 2016). Members of this stock are transient and make movements up and down the coast, and into some estuaries, throughout the year. Bottlenose dolphins are being observed in San Francisco bay more frequently in recent years (TMMC, personal communication). Groups with an average group size of five animals enter the bay and occur near Yerba Buena Island once per week for a two week stint and then depart the bay (TMMC, personal communication). Assuming groups of five individuals may enter San Francisco Bay approximately three times during the construction activities, we estimate 30 takes of bottlenose dolphins for 2016 (Table 5).

Analyses and Preliminary Determinations

Negligible Impact Analysis

NMFS has defined “negligible impact” in 50 CFR 216.103 as “...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.” A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of Level B

harassment takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be “taken” through behavioral harassment, we consider other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as the number and nature of estimated Level A harassment takes, the number of estimated mortalities, and effects on habitat.

Pile driving and removal activities associated with the ferry terminal construction project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (behavioral disturbance) only, from underwater sounds generated from pile driving and removal. Potential takes could occur if individuals of these species are present in the ensonified zone when pile driving and removal occurs.

No injury, serious injury, or mortality is anticipated given the nature of the activities and measures designed to minimize the possibility of injury to marine mammals. The potential for these outcomes is minimized through the construction method and the implementation of the planned mitigation measures. Specifically, vibratory hammers will be the primary method of installation (impact driving is included only as a contingency), and this activity does not have the potential to cause injury to marine mammals due to the relatively low source levels produced (less than 180 dB) and the lack of potentially injurious source characteristics. Impact pile driving produces short, sharp pulses with higher peak levels and much sharper rise time to reach those peaks. If impact driving is necessary, implementation of soft start and shutdown zones significantly reduces any possibility of injury. Given sufficient “notice” through use of soft start (for impact driving), marine mammals are expected to move away from a sound source that is

annoying prior to it becoming potentially injurious. WETA will also employ the use of 12-inch-thick wood cushion block on impact hammers, and use a bubble curtain as sound attenuation devices. Environmental conditions in San Francisco Ferry Terminal mean that marine mammal detection ability by trained observers is high, enabling a high rate of success in implementation of shutdowns to avoid injury.

WETA's proposed activities are localized; the entire project area is limited to the San Francisco ferry terminal area and its immediate surroundings. These localized noise exposures may cause short-term behavioral modifications in harbor seals, Northern fur seals, Northern elephant seals, California sea lions, harbor porpoises, bottlenose dolphins, and gray whales. Moreover, the proposed mitigation and monitoring measures are expected to reduce the likelihood of injury and more severe behavior exposures. Additionally, no important feeding and/or reproductive areas for marine mammals are known to be within the ensonified area during the construction time frame.

The project also is not expected to have significant adverse effects on affected marine mammals' habitat. The project activities would not modify existing marine mammal habitat for a significant amount of time. The activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such

activity were occurring) (*e.g.*, Thorson and Reyff, 2006; Lerma, 2014). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. Repeated exposures of individuals to levels of sound that may cause Level B harassment are unlikely to result in hearing impairment or to significantly disrupt foraging behavior due to the small ensonification area and relatively short duration of the project. Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in fitness for the affected individuals, and thus would not result in any adverse impact to the stock as a whole.

In summary, this negligible impact analysis is founded on the following factors: (1) the possibility of injury, serious injury, or mortality may reasonably be considered discountable; (2) the anticipated instances of Level B harassment consist of, at worst, temporary modifications in behavior; (3) the presumed efficacy of the planned mitigation measures in reducing the effects of the specified activity to the level of least practicable impact, and (4) the lack of important areas. In addition, these stocks are not listed under the ESA. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activity will have only short-term effects on individuals. The specified activity is not reasonably expected to and is not reasonably likely to adversely affect the marine mammal species or stocks through effects on annual rates of recruitment or survival, and will therefore not result in population-level impacts.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the planned monitoring and mitigation measures, we find that the total marine mammal take from

WETA's ferry terminal construction activities will have a negligible impact on the affected marine mammal species or stocks.

Small Numbers Analysis

Table 8 details the number of instances that animals could be exposed to received noise levels that could cause Level B behavioral harassment for the proposed work at the ferry terminal project site relative to the total stock abundance. The numbers of animals authorized to be taken for all species would be considered small relative to the relevant stocks or populations even if each estimated instance of take occurred to a new individual – an extremely unlikely scenario. The total percent of the population (if each instance was a separate individual) for which take is requested is approximately 14 percent for harbor seals, approximately nine percent for bottlenose dolphins, less than three percent for California sea lions, and less than one percent for all other species (Table 8). For pinnipeds, especially harbor seals occurring in the vicinity of the ferry terminal, there will almost certainly be some overlap in individuals present day-to-day, and the number of individuals taken is expected to be notably lower. We preliminarily find that small numbers of marine mammals will be taken relative to the populations of the affected species or stocks.

Table 8. Estimated Numbers and Percentage of Stock That May Be Exposed to Level B Harassment

Species	Proposed Authorized Takes	Stock(s) Abundance Estimate ¹	Percentage of Total Stock (%) ²
Harbor Seal (<i>Phoca vitulina</i>) <i>California stock</i>	4,426	30,968	14.3
California sea lion (<i>Zalophus californianus</i>) <i>U.S. Stock</i>	7,660	296,750	2.6
Northern elephant seal (<i>Mirounga anustirostris</i>) <i>California breeding stock</i>	21	179,000	0.01
Northern fur seal (<i>Callorhinus ursinus</i>) <i>California stock</i>	10	14,050	0.07
Harbor Porpoise (<i>Phocoena phocoena</i>) <i>San Francisco-Russian River Stock</i>	9	9,886	0.09
Gray whale (<i>Eschrichtius robustus</i>)	2	20,990	0.01

<i>Eastern North Pacific stock</i>			
Bottlenose dolphin (<i>Tursiops truncatus</i>) <i>California coastal stock</i>	30	323	9.3

¹ All stock abundance estimates presented here are from the draft 2015 Pacific Stock Assessment Report

² Percentage of total stock has been updated from the proposed FR notice for most species. Some percentages changed based on the new take calculations (harbor seal, Northern elephant seal, harbor porpoise), while others (Northern fur seal, gray whale) were entered incorrectly in the proposed draft.

Impact on Availability of Affected Species for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by this action.

Therefore, we have determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act (ESA)

No marine mammal species listed under the ESA are expected to be affected by these activities. Therefore, we have determined that section 7 consultation under the ESA is not required.

National Environmental Policy Act (NEPA)

NMFS conducted an analysis, pursuant to National Environmental Policy Act (NEPA), to determine whether or not this proposed activity may have a significant effect on the human environment. NMFS determined that these activities will not have a significant effect on the human environment and published a Finding of No Significant Impact.

Proposed Authorization

As a result of these determinations, we have issued an IHA to WETA to conduct the described construction activities for the Downtown San Francisco Ferry Terminal Expansion Project, South Basin Improvements Project, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Donna S. Wieting,
Director,
Office of Protected Resources,
National Marine Fisheries Service.

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